1993 SNA Rev 1 – Preliminary draft

List of chapters

General Notes to the Readers of the Preliminary Draft Chapters

The preliminary draft of chapters of the 1993 Rev1 are posted on the UN web site at http://unstats.un.org/unsd/sna1993/draftingPhase/ChapterIssueMatrix.asp for a period of 60 days during which comments from anyone interested in the SNA are welcome. It is hoped that members of the Advisory Expert Group (AEG) and national accounts staff in countries will be particularly willing and eager to offer comments. The preliminary draft will be revised in light of these comments to form the final draft. Because of the tight time table to produce the final draft, readers are informed that deadlines for comments cannot be extended. The deadline for each chapter is given on the page specific to each chapter

A comparison between each draft chapter and the corresponding chapter (if it existed) of the 1993 SNA is available. See the second section of this web page entitled "Reference text of the 1993 SNA"

In the draft chapters, definitions of national accounting concepts and terms are in bold italics. These definitions will also be extracted to form a glossary of key terms.

References to other chapters and other paragraphs in the updated *1993 SNA* are highlighted in yellow ***but have not yet been updated***. Final cross references will be inserted when the paragraph numbers have been finalized.. References to other manuals are highlighted in turquoise If there are other citations that would be useful, please submit these suggestions along with comments. .

The tables in the text have been reformatted. They appear inset into portrait pages. Most tables appear on successive left- and right-hand side pages. Within each chapter, a table may appear in several places with alternative detail in each appearance to draw attention to the section currently being discussed in the text. The full detail of each table will appear in an annex and this annex will be available electronically in Excel format so that users can see the embedded formula used to derive the tables.

The code numbers for transactions, flows, sectors, etc. have been suppressed in both the text and the tables for the moment. Discussions continue about changes to the existing codes for the 1993 SNA and until this is settled it is difficult to envisage the format of codes for a somewhat amended hierarchy. They will be inserted at a later stage.

The data values in the tables are being reviewed. Where new entries have been added, at present the entries are usually blank but this needs to be rectified. In general, (excepting this case) a blank entry signifies that no entry is possible. A possible entry appears as a zero. The occurrence of blanks and zeroes is being verified also.

Note by the Editor

The text put forward here for chapter 15 is very different from that in the 1993 SNA and this note attempts to explain why this is so.

Compiling a supply and use table is an intrinsic part of putting together a set of national accounts. Deriving a symmetric input-output table for analytical use much less so. The first step, therefore, was the decision of the ISWGNA to partition the chapter leaving the supply and use table part as a chapter in the first (2008) deliverable and putting the input-output table material into the second (2009) deliverable.

The comments on the present chapter 14 suggest that a reader should come to that chapter with a good understanding of the goods and services account. The obvious place to elaborate this account seems to be in connection with compiling supply and use tables. It was therefore agreed to do this and to place this chapter (and that on prices and volumes) before the existing chapter 14 in the next version of the complete set of chapters.

The text of the 1993 SNA chapter 15 expounds the definition of units (appearing in chapters 4 and 5), the definition of the different forms of output, the different definitions of valuation (both appearing in chapter 6) and definitions of consumption and capital formation (appearing in chapters 9 and 10 respectively). Alternative exposition of the same concepts may lead to inadvertent discrepancies and it was decided to replace the expositions in chapter 15 with cross-references to the other chapters just listed.

On the other hand, the text of the 1993 SNA chapter 15 did not explain the format of the supply and use tables and their use in balancing the accounts and improving the quality of the accounts. It did not explain why the tables are asymmetric with rows relating to products and columns to producing units. It did not explain that when final use was available classified according to function, a conversion from functional codes to product codes was necessary. It did not address the question of deriving a supply and use table in volume terms. Thus in addition to removing much existing material, new material was added to give a more comprehensive view of what exactly supply and use tables are and how they might be used.

Text has been introduced to incorporate the impact of changes accepted for the update. These include detailed consideration of how goods sent abroad for processing should be recorded in the tables and how transport margins are treated. Discussion of the use of functional classifications of final use make reference to the revised versions of these classifications (replacing thereby the text of the 1993 SNA chapter 17). There is discussion on how to compile a table in basic prices, using the new material in chapter 16 on prices and volumes as well as a discussion of deriving a table in volume terms.

The format of the tables has been made more consistent with those in other chapters. The various parts of a set of supply and use tables are introduced in very abbreviated form before being elaborated in the final section of the chapter. Table 15.3 in the previous chapter, showing a cross-classification between industries and sectors, has been dropped.

Please note that the tables will be adjusted to reflect the introduction of the revised ISIC and in particular the top-top classification. For the moment the side stubs only have been changed pending the completion of this work.

For anyone coming to the national accounts via a supply and use table, with no knowledge of the context of the earlier chapters of the SNA text, a version of the previous text will be available as an electronic annex to the chapter. This version will be somewhat longer than the 1993 text but will contain revisions to allow for the changes introduced in the update process.

Anne Harrison

10 October 2007

Chapter 15: The goods and services account and supply and use tables 1

Chapter 15: The goods and services account and supply and use tables

A. Introduction

15.1 The sequence of accounts described in chapters 6 to 13 portrays the working of the economy with particular emphasis on how income is generated, distributed, redistributed and used for consumption or the acquisition of assets and when assets are disposed of, or a liability is incurred, to acquire other assets or undertake more consumption than current income permits. An alternative view of the economy focusses less on income and more on the processes of production and consumption. Where do products come from and how are they used? The present chapter is concerned with this aspect of the accounts. It consists of a description of a commodity balance and the generalization of this to the goods and services account, as well as the practical and conceptual benefits of these accounts. It also shows how supply and use tables can be compiled for the economy and provides a link to input-output tables, which are described in chapter XX.

1. Commodity balances

15.2 The amount of a product entering an economy in an accounting period must be used for intermediate consumption, final consumption, capital formation (including inventories), or exports. The same amount of the product entering the economy must have been supplied either by domestic production or by imports. These two statements can be combined to give a statement of a commodity balance:

Output + imports = intermediate consumption + final consumption + capital formation + exports

15.3 The accounting rules from chapter 3 including the time of recording and the valuation rules from chapter 6 and elsewhere apply to each of the entries in this identity. Because the uses of products are usually valued at purchasers' prices, but production at basic prices, it is usual to add trade and transport margins, and taxes less subsidies on products to the left-hand (or supply) side of the identity so both sides are expressed in purchasers' prices. Thus a fuller articulation of ***the commodity balance for any product recognises that the sum of output at basic prices plus imports plus trade and transport margins plus taxes less subsidies on products is equal to the sum of intermediate consumption, final consumption and capital formation, all expressed at purchasers' prices, plus exports***. The valuation applied to imports and exports requires special consideration and is described in section XX below.

15.4 A commodity balance is an especially powerful tool for a compiler as is best illustrated by example. Typically the production of tobacco products, mainly cigarettes, is well measured but consumption of cigarettes is not, because of the reluctance of respondents to report accurately how much is spent on them in a household budget survey. Assuming that output, imports and exports are well measured then the identity of the commodity balance can be used to generate data for consumption that would be consistent with other items in the identity. The compiler can then use judgement to reach a balance by adjusting the components as necessary.

15.5 It is not always final consumption that is the weakest component of the identity. In the case of taxi services, for example, where much may be supplied by unregulated and unmeasured activity, the estimate of how much households spend on taxis may help improve the estimates of output to include these aspects of the non-observed economy.

15.6 Even for items where informal activity is not an issue, a commodity balance may be useful.

Aircraft manufacture is a long process. Work in progress may be measured either by the amount the manufacturer claims to have completed or by the amounts the potential purchaser has paid for by means of stage payments. These two sources of data need to be reconciled with adjustments in the financial accounts for accounts receivable or payable as necessary.

2. The goods and services account

15.7 If a commodity balance is drawn up for all goods and services in the economy (either individually or in groups of products) and these are aggregated, the totals for output, imports, intermediate consumption, final consumption, capital formation and exports must be equal to the corresponding items identified in the sequence of accounts elaborated in previous chapters. Further, since the figures for output and intermediate consumption correspond to the entries for output and intermediate consumption in the production account, the identity of the commodity balance may be rearranged to become ***the goods and services account, which reads:***

Output - intermediate consumption + taxes on products – subsidies on products = final consumption + capital formation + exports – imports.

As explained in chapter 6, the left-hand side of this identity is equivalent to GDP at market prices. (Unlike the commodity balance for an individual product, it is no longer necessary to add an adjustment for trade and transport margins because the commodity balances for transport and retail and wholesale trade must be included to cover the whole economy.) The right-hand side is therefore also equal to GDP at market prices and is the well-known statement of GDP often described as the "expenditure approach". By contrast the definition coming from the left-hand side of the identity is known as the "production approach" to GDP.

3. Supply and use tables

15.8 With a complete set of commodity balances, supply and use tables can be created. Supply and use tables exist in pairs with common valuation and level of detail as regards the products identified. The most common format of supply and use tables are at purchasers' prices. ***A use table at purchasers' prices consists of a set of commodity balances covering all products available in an economy arranged in the form of a rectangular matrix with the products, valued at purchasers' prices, appearing in the rows and the columns indicating the disposition of the products to various types of uses. A supply table at purchasers' prices consists of a rectangular matrix with the rows corresponding to the same groups of products as the matching use tables and columns corresponding to the supply from domestic production valued at basic prices plus columns for imports and the valuation adjustments necessary to have total supply of each [group of] product[s] valued at purchaser's prices.***

15.9 Sections B and C below describe the supply and use tables respectively.

15.10 Supply and use tables are a necessary first step in preparing input-output tables as described in chapter XX but have important uses on their own, both analytically and as quality control tools. When supply and use tables are first prepared, they are unlikely to balance and until they are brought into balance, GDP measured from the production account will differ from the expenditure measure of GDP. Only supply and use tables provide a sufficiently rigorous framework to eliminate discrepancies in the measured flows of goods and services throughout the economy to ensure the alternative measures of GDP converge to the same value.

15.11 Some countries with less advanced statistical systems still have difficulty in deriving a detailed breakdown of household consumption expenditure from direct sources on a regular basis. Such a breakdown is necessarily available from within a set of supply and use tables with the consequence that the proportionate distribution of expenditure on different product groups can be compared with the weights used in a CPI as a means of checking both the CPI weights and the supply and use tables for plausibility and consistency.

4. The industry dimension

15.12 It is conceptually possible to compile a set of supply and use tables with intermediate consumption treated in total only, with the use table showing how much of each product is used for intermediate consumption but with no further detail. However, from the earliest elaboration of supply and use tables and input-output tables onwards, further detail was introduced to relate the products used in the economy to the units producing them. The simplest case and the one most often elaborated in text books assumes that it is possible to establish a one-to-one correspondence between products and producing units. This indeed is the motivation for defining an establishment as a unit producing only one type of product. However, there is no necessary reason for the match to be one-to-one and many countries now work with matrices where many more groups of products are distinguished than groups of producing units. The most important reason for this is that most units produce very many products, for example, a footwear manufacturer may make sandals, sports shoes, uniform boots and fashion shoes and it would be neither practicable nor interesting to try to create an establishment for each type of footwear.

15.13 Once a set of producing units is determined, the supply matrix is expanded to show exactly which products each of the producing units supplies and the use matrix is expanded to show intermediate demand for each of these producing units. In addition, extra information relating to the producing units is appended below the demand for intermediate consumption so that the columns corresponding to the producing units contain the components of value added as well as total output. Further information relating to capital formation and number of employees, for instance, may also be added. These extensions are discussed in section D.

5. A numerical example

15.14 Tables illustrating supply and use tables are shown in section E with associated descriptive text.

B. The supply table

15.15 The main part of the supply matrix is a matrix of products (or commodities) by industry showing which industry supplies or "makes" which product. For this reason, it is sometimes described as a "make matrix".

1. Products and producing units

15.16 While it is possible to compile a supply table using enterprises as the basic building block, it is more common to work with establishments. As noted in the introduction, the idea of an establishment as a unit where only one type of product is produced is the natural outcome of an idea of an input-output table where there is a one-to-one correspondence between the groups of products distinguished and the groups of producing units distinguished. All the conventions described in chapter 5 about when an establishment is identified apply in the context of using establishment data for a supply matrix; indeed although establishment-level data may be used in the context of short-term economic indicators, they are used in the System only in the context of the supply and use tables.

15.17 The basis for grouping products is most commonly an aggregation of CPC and the resulting groups were often described as "commodities" though modern usage would be "products". The basis for grouping producing units is most commonly ISIC and the resulting groups are often described as "industries".

15.18 In the case where there are the same number of producing units as there are products, there will be one large entry in one cell of the column representing the principal product of that producing unit, that is the product that gives rise to the largest proportion of value added. If the producing units are pure establishments, there will be no other entries in the column but most often

there will be some secondary production showing as smaller entries in other cells in the column.

15.19 When there are the same number of producing units as products, the rows and columns are arranged so that the entries for the principal products fall on the diagonal of the resulting matrix.

15.20 In practice, it is common for there to be more products than types of producing units. For example it is interesting to specify different sorts of agricultural crops but less interesting or practical to distinguish farms specialising in each of the possible sorts of crop. For this reason, the make matrix may be rectangular with more rows than columns but arranged with similar products in adjacent rows so that an aggregation of the rows for similar products would again produce a square matrix.

15.21 The greater the amount of product detail that is used, the more there will be a scatter of entries around the entries for the principal products, for example when a farm produces more than one crop or a manufacturer of machinery produces different types of machine. At a level of detail such as "agricultural product"' and "machinery" these off-diagonal elements will be merged in a larger diagonal element.

15.22 However, as well as similar products, many establishments produce some retail and wholesale margins, some transport services and some construction, the last sometimes being produced for own use as capital formation.

2. Accounting rules

15.23 All the rules about time of recording, re-routing and partitioning of transactions described in chapter 3 apply to the entries in the supply and use tables.

15.24 Although the supply and use tables do not record property income flows, the financial service elements associated with the payment of interest and with the acquisition and disposal of financial assets and liabilities are recorded in the supply and use tables. Chapter 17 explains in detail what sorts of financial service flows are associated with transactions in financial assets and property income flows.

15.25 The re-routing of flows associated with margins is described below under valuation.

3. Production

15.26 The principles for recording output in the supply and use tables are exactly the same as those for recording output in the production account, as described in chapter 6. It cannot be emphasised too strongly that all the concepts and definitions of the System elaborated in previous chapters describing the sequence of accounts, apply equally and exactly to supply and use tables and input-output tables. The only difference is in the manner of presentation of the accounts, not in the underlying fundamentals of the System.

15.27 As noted in the introductory section, the producing units to be identified in the supply and use tables are determined by reference to an industrial classification such as ISIC. However, it may also be useful to distinguish which producing units are market-based and which are non market-based. This may be applied generally or to just those groups where significant production on both bases is common, for instance in health and education services. Similarly, production on own account may also be of special interest and can be distinguished within the ISIC categories, for instance for construction.

15.28 In general, in keeping with the guidance on their treatment given in chapters 4 and 5, ancillary activities are not treated as giving rise to products that are recorded as output in the accounts. One exception is when some products are used both for own ancillary use and are supplied to another unit. Another exception is where it is appropriate to treat the unit producing the ancillary products as a separate establishment because of its geographical location where it may be a source of significant employment.

15.29 Bearing in mind the discussion about units, the production part of the supply matrix is a matrix with rows corresponding to product groups and columns corresponding to types of producing units. The entries in this matrix show the value of

output of each type of product by each type of producing unit. The goal of creating establishments is to partition horizontally and vertically integrated enterprises so that each row and column of the matrix is dominated by one entry with zeroes elsewhere.

15.30 Table 15.1 shows a very abbreviated version of the production part of the supply matrix. Although the fact that most entries in the sub-matrix for market production are zero is not apparent, this is more obvious for production for own final use and for non-market production.

Table 15.1: Abbreviated version of the production part of the supply table

	Market production	Production for own final use	Non-market production	Total
1 Agriculture, forestry and fishing products	78	9	0	87
2 Manufactured goods, mineral and other industrial products	41	0	0	41
3 Construction work	154	0	0	154
4 Wholesale and retail sale, transport, accommodation and food services	1 707	7	0	1 714
5 Information and communication services	213	31	0	244
6 Financial and insurance services	165	0	0	165
7 Real estate activities	96	0	0	96
8 Business services	474	95	0	569
9 Public administration, defence, education, health and social work services	149	5	212	366
10 Other services	0	0	168	168
Total	3 077	147	380	3 604
Of which:				
Market production	3 051	2	4	3 057
Production for own final use	26	145		171
Non-market production	0	0	376	376

4. Imports

Classification

15.31 In order to add imports to domestic production to reach total supply, imports must be classified by products in a manner consistent with that used for domestic production. This is not always straightforward since imports (and exports) are classified not according to CPC but according to the HS or SITC. Finding a level of aggregation of the trade data that is sufficiently detailed but also consistent with domestic production may be a factor in determining the level of detail to be adopted in the supply and use tables.

Goods for processing

15.32 The traditional view of an input-output table or a supply and use table was that it portrayed the physical or technological process of production. The aim was to show which products were combined, and in what proportions, to make other products. One consequence of this, in combination with the idea of establishments, was that if one establishment of an enterprise was responsible for making steel and another for making steel products, the steel from the first establishment was shown as being delivered (or "sold") to the second. This meant the final customer for the steel products bought them entirely from the second establishment and the production account showed the value of the steel included in both intermediate inputs and output. A similar approach was taken for goods sent abroad for processing but then returned to the original economy.

15.33 In terms of the System, this approach amounts to imputing a change of ownership when goods are delivered from the first unit to the second. For imports and exports this is particularly inappropriate since to ensure consistency in the System, financial transactions that do not take place have to be imputed to match the imputed change in ownership of the goods. In reality, though, the unit processing the goods assumes no risk associated with the eventual marketing of the products; the risk remains with the legal owner. The processor is not at risk from (and does not benefit from) any unexpected changes in prices of either the components or the final product. The only risk the processor accepts is limited to meeting the contractual commitment in the most cost-effective manner.

15.34 With the increasing importance of out-sourcing under globalisation of markets, there is great interest in knowing where the returns to labour arise and how far operating surplus accrues to the processor and how far to the unit that contracts the processing.

15.35 The value of goods sent abroad for processing (and returned from abroad after processing) should not be included in imports (or exports). They should be recorded in the intermediate consumption of the unit ordering the processing and not the processor. Excluding these goods from imports and exports, like excluding them from intermediate consumption and output, does not change the current balance on goods and

services any more than it changes value added and GDP. It does, however, change the ratios of imports and exports to GDP and gives a more realistic picture of the extent to which domestic financial resources are required to fund imports or benefit from exports.

15.36 More extensive discussion on the treatment of goods for processing (and the similar but distinct case of merchanted goods) is given in chapter XX but the consequences for supply and use tables and input-output tables are extremely significant and change many of the traditional perceptions about what information is conveyed in these tables.

5. Valuation

15.37 As explained in the introduction, in order to balance total supply with total use, both must be valued in the same way. The most usual way to achieve this is to raise total supply to purchaser's prices and this is the approach described here. However, the alternative, of reducing total use to basic prices is also considered in section D under discussion about deflating the supply and use tables to prices of another year.

15.38 It is helpful to begin by recapitulating the distinction between purchaser's, producer's and basic prices as explained in chapter 6 and, because of the complexity of VAT, to itemise the difference between the three ways in which VAT is recorded.

(a) Invoiced VAT is the VAT payable on the sales of a producer; it is shown separately on the invoice that the producer presents to the purchaser;

(b) Deductible VAT is the VAT payable on purchases of goods or services intended for intermediate consumption, gross fixed capital formation or for resale that a producer is permitted to deduct from his own VAT liability to the government in respect of VAT invoiced to his customers;

(c) Non-deductible VAT is VAT payable by a purchaser that is not deductible from his own VAT liability, if any.

15.39 Bearing these ways of recording VAT in mind, the price bases in the System are expressed as follows:

(a) The purchaser's price is the amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place;

(b) The producer's price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any VAT, or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer;

(c) The basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer.

15.40 The three price valuations can be linked schematically as follows:

Purchasers' prices

Less Invoiced transportation charges

Less distribution margins

Less non-deductible VAT

Equals ***producers' prices***

Less taxes on products resulting from production excluding invoiced VAT

Plus subsidies on products resulting from production

Equals ***basic prices.***

15.41 Thus the three factors that need to be considered in converting output and imports to purchasers' prices are:

Transport margins

Trade margins

Taxes less subsidies on products

Each of these is considered in turn below.

Transport margins

15.42 It is helpful to consider the case of domestic transport charges first and see how they are included in the supply and use tables before turning to transport margins on imports.

Domestic transport charges

15.43 As explained in chapter 6 paragraphs XXXX, if the producer agrees to deliver the product to the purchaser without explicit charge, the cost of delivery, the transportation margin, is included in the basic price. Only if the purchaser is explicitly invoiced for the delivery does the transportation margin form part of the purchaser's price.

15.44 Consider the situation where a unit, A, sells a product to unit B. For simplicity it is assumed they are both producers with factories some distance apart. If B collects the product from A, the price charged is 200. The cost of transport from A's factory to that of B is 10. Both A and B have delivery fleets that can transfer the product from A to B or either may use a third party, C, to make the transfer. Ten per cent tax (not VAT) is payable on both the cost of the product and the transport costs. Different values of the three possible prices result from the alternative means of moving the product from A to B as shown in table 15.2

Table 15.2: Example of the impact on prices of transport margins

Delivery method	Basic price	Tax	Producer's price	Transport margin plus tax	Purchaser's price	Comment
A charges B an all-inclusive price and uses own delivery fleet	210	21	231		231	Transport is an ancillary activity of A
A charges B for delivery but uses own delivery fleet	200	20	220	11	231	Transport is a secondary activity of A
A charges B an all-inclusive price but uses C to deliver	210	21	231		231	C's production is intermediate consumption of A
A charges B for delivery but uses C to deliver	200	20	220	11	231	C's production is intermediate consumption of A
B collects the product from A using own delivery fleet	200	20	220		220	Transport is an ancillary activity of B
B uses C to collect product from A and deliver to B	200	20	220	11	220 11	B buys 2 products; one from A for 220 and one from C for 11

15.45 The entries in the use matrix will be quite different for each of these six cases, even though the total cost to B is similar throughout. Only when B collects the product itself is the purchaser's price for the product plus delivery less than 231. In this case it must be assumed that the internal costs of collection are 10, as before, so only the tax payable on this, 1, is a reduction in the overall cost even though the purchaser's price

is 220 compared with 231 for other modes of delivery.

15.46 When A or B undertake transport as an ancillary activity, the cost of petrol and other consumables will appear in intermediate consumption, the driver's wages in compensation of employees and there will be consumption of fixed capital recorded in respect of the vehicle used.

15.47 These entries will appear for A when it is undertaking a secondary activity but the cost of the secondary activity will appear as intermediate consumption of the primary activity.

15.48 When C acts as an agent for A, whether A charges B directly for C's services or not, the cost of C's services form part of A's intermediate consumption. When C is hired directly by B, then the service cost is part of B's intermediate consumption.

15.49 The rationale behind these different recordings is that the point when change of ownership occurs is different under the different scenarios. If A agrees or is obliged to provide transport to B, even for a charge, than change of ownership takes place when the product is delivered to B's factory. If B agrees or is obliged to arrange delivery itself, then change of ownership takes place when the product leaves A's factory.

International transport charges

15.50 The information for allocating domestic transport charges is typically available to national accountants from survey information collected from domestic establishments. In the example above, information from A, B and C would, in principle be available. For products delivered to establishments abroad, this is not the case. Either A or B is non-resident and possibly C also. The most common situation is where use of information coming from the administrative records compiled by customs authorities must be used. Increasingly, however, some products circulate without direct customs supervision and recording. This applies to services but services seldom if ever have transportation charges associated with their delivery.

15.51 The following are examples of goods not covered in customs statistics:

Goods circulating within a single customs area that spans several economies;

Goods delivered to off-shore establishments such as oil platforms;

Certain types of goods, such as diamonds and other precious goods of high value but small volume, that may be carried by persons;

Ships and aircraft, which, while hardly concealable in a physical sense, may be difficult to distinguish from the vehicles that belong to another economy and simply transit through the domestic economy.

It is therefore appropriate to consider products subject to customs documentation separately from other internationally traded products. Separate consideration also must be given to transport related to merchanted goods and goods sent abroad for processing.

Products not included in customs documentation

15.52 In the absence of customs documentation, information must be obtained from surveys and other sources and will typically record the prices at which transactions are actually undertaken. The analysis above for goods transported within the domestic economy are likely to apply to international transport also. When the supplier (exporter) commits to deliver goods to the importer, the value of the goods will include the transport costs. When the purchaser (importer) is responsible for transport, the value of the goods excludes the transport costs and these feature as a separate purchase. Whichever of the units takes responsibility for the transport, the value of the goods for both the exporter and importer are identical. This is an important distinction from the valuation used in customs merchandise trade statistics as discussed in the immediately following section.

15.53 Following the example in the previous section, if A and B are resident in different economies, whenever A takes responsibility for delivery to B,

the value of exports from A (and the corresponding value of imports to B) includes the transport element. If B takes responsibility for the transport from A, then neither the value of export from A nor the value of imports into B include the value of the transport.

15.54 If the third party, C, is used to undertake the transport, the residence of C is important in determining the value of total imports and exports. If C is co-resident with A and provides services to A, this is a domestic transaction within A's economy. However, the value of the exports of goods from A will reflect the fact that they must cover the cost of services bought from C. If C is co-resident with A but provides services to B to transport the goods from A to B, then C also provides exports to B but these are shown as exports of transport services, not of goods.

15.55 If C is co-resident with B and contracts with A to transport goods to B, there are imports of transport services from B's economy to A's which are then re-exported to B's economy. If C contracts with B to transport the goods, this is a domestic transaction for B's economy even though C is operating in foreign territory in collecting and moving the goods.

15.56 If C is resident in an economy other than that of A and B, then the services provided to A constitute exports of services from C's economy to A's and the value of the goods exported from A to B are sufficient to cover this cost of imports just as previously they covered the cost of a domestic transaction. If C contracts with B to move the goods, the cost shows as an export of services from C's economy to B's.

15.57 As in the domestic case, the question of whether the value of goods is sufficient to cover the cost of transportation or not depends on whether the exporter or importer is responsible for transport. Again this is equivalent to whether change of ownership takes place after or before transportation from A to B.

Products covered by customs documentation

15.58 In most countries, most information on imports and exports of goods will come from customs declarations. These declarations are compiled for administrative purposes, namely the levy of import and export duties and are therefore not necessarily ideal for use in the national accounts or balance of payments context but are used because of their general availability and consistency of valuation.

15.59 Within customs declarations, imports are valued cif (that is, they include the cost of carriage, insurance and freight) at the point of entry into the importing economy. This valuation is standard, regardless of whether any of the cif elements are provided by domestic enterprises because import duties are imposed on the cif valuation. It also excludes the cost of transport from the border of the importing economy to the premises of the importer. This transport also may be provided by either a resident or non-resident carrier. Exports are valued fob (free on board) at the point of exit from the exporter's economy. It includes the cost of transport from the exporter's premises to the border of the exporting economy. The cif/fob valuation principles arise from the common situation where goods are transported by ship from one country to another and it is not unreasonable to assume that transport to and from the ship would be undertaken by carriers resident in the relevant economy. This assumption may still hold in the main for goods transported by sea and air. It is much less satisfactory for goods transported overland where a single vehicle may transport goods from the exporter to importer without a break at national borders.

15.60 As noted already, if it is the exporter that contracts the delivery (whatever the nationality of the carrier) it is correct that the cost of transport is included in the value of the good imported, though describing this as cif is not helpful in an SNA context since it is a legitimate part of the cost of the imported good and should not be seen as a separate import of transport services. The delivery contractor provides services to the exporter and these are shown as an import of services to the exporting economy if the contractor is not co-resident with the exporter.

15.61 If it is the importer that contracts the delivery and if the carrier is not co-resident with the importer, an import of services takes place and, ideally, for

the SNA it would be desirable to separate the cif value into a goods only and transport service element. If the importer undertakes delivery itself or contracts with a unit resident in the same economy, there is in fact no import of services even though it will appear there is when imports of goods are recorded cif. To counteract this, a fictional export of the same amount of services must be shown to leave the current balance of goods and services correct.

Transport on merchanted goods

15.62 Merchanting is a process whereby a unit in economy X purchases goods from economy Y for sale in economy Z. The goods are owned by a unit in country X but do not enter the territory of that economy. The services provided to transport the goods from Y to Z may be paid for by any of the units in X, Y or Z and should be recorded consistently with the principles outlined above. (See chapter XX for more on merchanting.)

Transport on goods sent abroad for processing

15.63 Goods sent abroad from economy X to economy Y for processing without changing ownership, after which they are returned to economy X, are not shown as either exports of goods from X to Y or subsequently as exports of goods from Y to X. Instead the difference in value between the goods after processing compared with the value before processing is shown as an export of service from Y to X. However, there are costs of transporting the goods on both the journey from X to Y and then on the return journey from Y to X. The costs of these journeys, excluding the value of the goods themselves, must be shown as transportation services. If X is responsible for transport on either the outward or inward journey, the cost is an import to X's economy unless it is carried out by X or another unit co-resident with X. If Y is responsible for the transport, the cost is an import to Y unless it is carried out by Y or another unit co-resident with Y. When Y is responsible for transport costs (on either or both journeys) the costs will be covered by the increase in value of the goods and hence in the value of the exports of services from Y to X.

Recording transport margins in the supply and use tables

15.64 In the supply and use tables, the use of goods is always at purchasers' prices. As shown in table 15.2, this value will often be the same however the good is transported from the seller to the buyer. The only exception is when the buyer fetches the goods using its own resources. The way the transport service shows in the use table however, depends critically on how the service is provided (using own resources or a third party contractor) and to whom (the buyer or seller). The different forms of recording in different circumstances are indicated in table 15.2.

15.65 Imports of goods are to be recorded in the supply table at basic prices with taxes and margins added subsequently. There is no universally appropriate valuation for imports of goods at basic prices. The following recommendations should be noted.

a. If the data come from other than customs documentation, it is to be assumed that actual transaction prices are used and it should be clear whether transport services are separately invoiced or not. If so, the basic price excludes the value of transport; if not, the basic price value of goods includes transport costs. The purchaser's price will differ from the basic price only because of any taxes and subsidies payable by the purchaser.

b. If the data come from customs documentation and if it is the exporter of the goods who is responsible for meeting the transportation costs, the value of the goods at basic prices should include the transport costs. In this case a cif valuation will approximate the basic price (approximate unless a domestic carrier assumes responsibility for transport at the border of the importing country). The purchaser's price will differ from the basic price only because of any taxes and subsidies payable by the purchaser.

c. If the data comes from customs documentation and if it is the importer of the goods who is responsible for meeting

the transportation costs, the value of the goods at basic prices should exclude the transport costs. In this case an fob valuation will approximate the basic price (approximate because the value of transport from the place or origin to the border of the exporting economy is included in the fob valuation). The purchaser's price will differ from the basic price because of the transport costs incurred plus any taxes and subsidies payable by the purchaser.

d. It may not be possible to determine from customs declarations which unit is responsible for the transport costs and, even when it is and conceptually the transport costs should be separated from the value of the goods themselves, there may be no information and no resources available to make the separation in practice. In such a case the cif value of imports may be the only source with a disaggregation by type of good. If the disaggregated cif figures are used for imports of goods, though, that part of the transport costs and insurance also included in imports of services would be double-counted. In order to avoid this, therefore, an adjustment column is inserted into the supply table. The adjustment column consists of a deduction from the services items for transport and insurance equal to the cif-to-fob adjustment for these items with an offsetting global adjustment made to imports of goods. Table 15.3 gives an example of such an adjustment.

Table 15.3: An example of imports entries in the supply table with the global cif-to-fob adjustment

	Cif/fob adjustment	Goods	Services
1 Agriculture, forestry and fishing products		37	
Manufactured goods, mineral and other			
2 industrial products		60	
3 Construction work		1	
Wholesale and retail sale, transport,			
4 accommodation and food services		283	
5 Information and communication services		1	
6 Financial and insurance services			36
7 Real estate activities	- 6		26
8 Business services	- 4		17
Public administration, defence, education,			
9 health and social work services			5
10 Other services			
Adjustments			
Cif/fob	10	- 10	
Purchases abroad by residents		20	23
Total	0	392	107

Trade margins

15.66 In the supply table, trade margins are treated in a manner similar to that of separately invoiced transport margins on domestic production. The value of output, except the products corresponding to wholesale and retail services, excludes trade margins. Within the supply table, the margins for each product other than wholesale and retail services are added to the basic value and at the same time, the value of wholesale and retail services is reduced by the same amount. An example of the trade and transport margins combined for the supply table is given in table 15.4.

Table 15.4: An example of the entries to adjust supply to include trade and transport margins

	Trade and transport margins
1 Agriculture, forestry and fishing products	2
Manufactured goods, mineral and other	
2 industrial products	2
3 Construction work	0
Wholesale and retail sale, transport,	
4 accommodation and food services	74
5 Information and communication services	0
6 Financial and insurance services	- 68
7 Real estate activities	- 10
8 Business services	0
Public administration, defence, education,	
9 health and social work services	0
10 Other services	0
Total	0

Taxes and subsidies on products

15.45 The taxes and subsidies on products that add to the value of products available in the economy are exactly those described as taxes and subsidies on products in chapter 7. Taxes on production are included in the basic price measurement of output and subsidies on production are excluded so do not feature in the adjustment for taxes that intervenes between a valuation at basic prices and purchasers' prices.

15.48 Value added type taxes in the System include VAT proper and taxes that are deductible in a way similar to VAT and are treated in the same way as VAT. The System recommends that output, even at producers' prices, is valued excluding VAT invoiced by the producer; imports also are valued excluding invoiced VAT. For intermediate and final use,s the purchases of goods and services are recorded including non-deductible VAT only.

15.50 The general cases in which VAT is usually deductible, non-deductible or just not applicable are as follows:

Deductible VAT:

Most of intermediate consumption

Most of gross fixed capital formation

Part of changes in inventories.

Non-deductible VAT:

Most of final consumption expenditure

Part of gross fixed capital formation

Part of changes in inventories

Part of intermediate consumption.

VAT not applicable:

Exports

Any goods or services subject to a zero rate of VAT regardless of their use

Any producers exempted from VAT registration (small businesses or the like).

15.51 When output is at basic prices, the taxes column contains total non-deductible VAT on products, taxes and duties on imports excluding VAT, export taxes, and taxes on products excluding VAT, import and export taxes. When output is at producers' prices, the taxes column includes only taxes and duties on imports (excluding VAT), plus total non-deductible VAT on those products.

15.52 Subsidies are recorded as if they were negative taxes on products or negative taxes on production. Only subsidies on products (if any) are entered into the column for the tax adjustment to the valuation of supply; they appear with a negative sign to indicate they reduce the value of purchasers' prices rather increase it.

15.67 An example of the entries to adjust supply to include taxes less subsidies on products is given in table 15.5

Table 15.5: An example of the entries to adjust supply to include taxes less subsidies on products

		Taxes on products	Subsidies on products
1	Agriculture, forestry and fishing products	5	- 3
2	Manufactured goods, mineral and other industrial products	0	0
3	Construction work	5	0
4	Wholesale and retail sale, transport, accommodation and food services	94	- 5
5	Information and communication services	17	
6	Financial and insurance services	3	
7	Real estate activities	5	
8	Business services	8	
9	Public administration, defence, education, health and social work services	4	
10	Other services	0	
	Total	141	- 8

C. The use table

15.68 A use table can be viewed as a rectangular table with four quadrants, two in the upper part and two in the lower part. The lower right quadrant is empty. The upper left quadrant consists of a sub-matrix showing the use of different products by different producing units. The upper right quadrant consists of a sub-matrix showing the use of different products by final consumers and ;a sub-matrix showing the use of different products for capital formation. Each of these three sub-matrices is described below.

15.69 The upper part of the use matrix can be valued at purchaser's prices or at basic prices. In this section sub-matrices at purchasers' prices are discussed. The alternative valuation at basic prices is discussed in section D along with consideration for expressing the use table in volume terms.

15.70 Together the left-most quadrants can be viewed as a set of columns, each relating to a group of producing units, containing information relating to the production and generation of income accounts

plus other information that can be attributed to groups of producing units at a more disaggregated level than groups of enterprises. This other information consists of capital formation and the number of employees for each type of producing unit. These aspects are also discussed in section D.

1. The use of products by producing units

15.71 The sub-matrix showing the use of specific products by each type of producing unit (the upper left quadrant of the table) has long been considered one of the more interesting aspects of supply and use tables and input-output tables. It gives a picture of how products are converted to more complex products either for yet further processing or for sale to final users or as exports. Unlike the make matrix, which also shows products by producing units, the sub-matrix of the use table (sometimes called the "absorption matrix") is densely rather than sparsely populated. The pattern of inputs for market, own final use and non-market producers of the same products are likely to bear a strong resemblance to one another but the variations give insights into how the characteristics of the three sorts of production vary.

15.72 The definition of intermediate consumption and the borderlines with payments for the use of labour and capital are exactly as explained in chapter 6.

15.73 Compiling the sub-matrix usually starts from information provided by establishments about their intermediate consumption. These may be classified according to the purpose they serve rather than the type of good. The classification of outlays of producers by purpose (COPP) (ref) consists of six main headings that apply to intermediate consumption of establishments, only one of which relates to current production programmes. The other five cover more general categories such as outlays on marketing and human resource development that are common to most establishments. Use of this detail in the form of a satellite account is discussed in chapter XX.

15.74 When this is all the information available to the compiler, he must make a judgement of what type of products will be covered in each heading allowing for variations between producing units of different types.

15.75 It is important to bear in mind the interpretation of data in this sub-matrix. The total across the rows show how much of a given product is used as intermediate consumption by all producing units. The total down a column shows the total of all types of products used as intermediate consumption by a single type of producing unit. There is absolutely no reason why the relative size of these two entities should be related in any systematic manner but mistaking one concept for the other is a common error made by users not very familiar with the nature of a supply and use table.

15.76 Table 15.6 shows an abbreviated version of the intermediate consumption part of the use matrix. Whereas table 15.1 show that most manufactured products are produced by the market producers in the manufacturing industry, table 15.6 shows that all three types of producers use manufactured products and that only about half of manufactured products are used in manufacturing industries.

Table 15.6 Abbreviated version of the intermediate consumption part of the use table

	Market production	Production for own final use	Non-market production	Total
1 Agriculture, forestry and fishing products	82	1	5	88
2 Manufactured goods, mineral and other industrial products	96	0	0	96
3 Construction work	114	0	9	123
4 Wholesale and retail sale, transport, accommodation and food services	880	32	80	992
5 Information and communication services	22	0	18	40
6 Financial and insurance services	57	0	4	61
7 Real estate activities	71	0	7	78
8 Business services	227	17	65	309
9 Public administration, defence, education, health and social work services	45	0	50	95
10 Other services	0	0	1	1
Total	1 594	50	239	1 883
Of which:				
Market production	1 594	50	239	1 883
Production for own final use				
Non-market production				

2. The use of products for final consumption

15.77 As explained in chapter 9, there are three types of units that undertake final consumption, households, NPISHs and general government. The manner of compiling the sub-matrix of the use table showing the use of products for final

consumption is similar for each of the three types of consumer but starts from a different classification for each of them.

15.78 Information on consumption by households usually starts from household surveys. In these, household expenditures are classified according to the classification of individual consumption by purpose (COICOP) (ref). This shows how much a household spends on ten main categories of expenditure, such as food, clothing and housing. This is useful for analysis of how much of household consumption goes on essentials, for instance, and is basic to the establishment of weights for the consumer price index but it is not in the necessary format for inclusion in the use table. For that a conversion table is necessary showing which of the designated products are purchased as food, which as clothing and so on.

15.79 A similar approach is used for consumption expenditure by NPISHs but starting from the classification of the purposes of non-profit institutions serving households. (COPNI) (ref). COPNI spells out the different sorts of NPISHs there may be by their objectives, for example, whether they undertake research and scientific services, education services or are religious associations. Given this knowledge, it should be possible to determine whether the NPISH is one with costs mainly limited to those associated with running an office with few paid employees or whether there are significant costs associated with acquiring goods and services to pass on to households, for instance.

15.80 For general government the starting classification is the classification of functions of government (COFOG) (ref). This classification is consistent with that proposed in the GFSM and shows a breakdown of government expenditure by standard functions associated with general public services, defence, law and order and so on. As with the classification for NPISHs, knowing the type of function gives a way to allocate the expenditure between intermediate consumption and other expenditure and to allocate intermediate consumption to specific product types.

15.81 It is possible to split the columns for general government (and NPISHs if appropriate) to show individual consumption expenditure and collective consumption expenditure separately in order to calculate actual consumption rather than consumption expenditure as explained in chapter 9.

15.82 When these entries are compiled at purchasers' prices, as assumed in this section, there are no entries for consumption of wholesale and retail services as these are included with the expenditure on the products to which they apply. Equally, taxes payable on products are included in the purchaser's values and do not show separately. (These statements apply equally to products used for intermediate consumption and for capital formation but are much more significant for final consumption.)

15.83 Table 15.7 illustrates the part of the use table for final consumption.

Table 15.7: The final consumption part of a use table

		Households	NPISHs	General government	Total
1	Agriculture, forestry and fishing products	28		2	30
2	Manufactured goods, mineral and other industrial products	2		0	2
3	Construction work	36		0	36
4	Wholesale and retail sale, transport, accommodation and food services	567		3	570
5	Information and communication services	3			3
6	Financial and insurance services	37			37
7	Real estate activities	14			14
8	Business services	250			250
9	Public administration, defence, education, health and social work services	58	14	204	276
10	Other services	6	2	159	167
	Purchases abroad by residents	43			43
	Domestic purchases by non-residents	- 29			- 29
	Total	1 015	16	368	1 399
	Of which:				
	Market production	898		15	913
	Production for own final use	110			110
	Non-market production	7	16	353	376

3. The use of products for capital formation

15.84 There are three types of capital formation to be examined, gross fixed capital formation, changes in inventories and acquisition less disposal of valuables.

Gross fixed capital formation

15.85 Allocating gross fixed capital formation to products is the easiest part of the use table since the categories of fixed capital fall quite naturally into product groups. Further they will often by exempt from taxes on products and not subject to

trade margins. However, some assets are subject to costs of ownership transfer on acquisition and disposal and these costs need to be allocated to the appropriate product. This product may be trade or transport but may also be legal services or real estate services, for example, depending on the asset concerned.

15.86 One aspect that does need to be mentioned, though, is the treatment of existing goods that are resold to another unit. (This applies to consumption expenditure also but is described here because it is most common for fixed capital.)

Resale of existing goods

15.87 Strictly speaking, it is not exactly true that all goods available for purchase in the domestic market come from domestic production or imports. Some goods may exist in the economy already and simply change owners. The most obvious example is fixed capital, where buildings and vehicles are regularly sold before their useful life is exhausted. In this case, the supply of goods is recorded not as a positive entry in the supply table but as a negative entry in the use table.

15.88 When a building is sold, for example, the seller records negative fixed capital formation and the purchaser records positive fixed capital formation. These items frequently do not offset one another exactly as there may be costs of ownership transfer associated with the exchange. As explained in chapter 10, costs of ownership transfer incurred by the seller should be written off during the period the seller has owned the asset, so that treating the costs incurred at the time of disposal bring the balance sheet value of the asset back to zero. For the purchaser, costs of ownership transfer on acquisition of the asset are recorded as part of gross fixed capital formation and, in turn, are written off over the period the purchaser expects to use the asset. In this way costs of ownership transfer of both disposal and acquisition are treated as new fixed capital formation.

15.89 Fixed assets may not always be sold to other producers in the same economy. For example, it is common for aircraft to be sold abroad. In this case, the supply of the aircraft is still recorded as negative capital formation but the use is recorded as an export.

15.90 Even when an asset is no longer cost effective, it may have a residual valu,e for example as scrap. In that case the supply is recorded as negative capital formation and the use as intermediate consumption of a producing unit processing the scrap. Chapter 10 also explains why the total of consumption of fixed capital over the life of the asset is not necessarily the whole value of the asset on acquisition but the difference between the value of the asset on acquisition and its value on final disposal, in the case the scrap value. In case where the scrap value does not coincide with the residual balance sheet value of the asset immediately before disposal, an adjustment is to be made to the value of the asset via the other changes in the volume of assets account.

15.91 Second-hand assets may also become household consumption expenditure, as for example when a hire car company sells its cars.

15.92 If a unit disposes of more assets than it acquires in a period, it will have negative capital formation. It is possible, though not very common, for the figure of capital formation for a group of producing units also to be negative in such a case.

15.93 As explained in chapter 9, it is assumed that a household consumes products at the moment they are acquired. In the case of consumer durables this is not strictly so and consumer durables may be sold or donated to other units at a later time (for example in response to requests for disaster relief). In this case also, the supply of the goods in question is treated as negative expenditure by the previous owner and positive use by the new owner (including households in the rest of the world). The way in which the income element of donations to other units is handled is via transfers, as explained in chapter 8 but for a supply and use table this aspect is not relevant since it is only the physical disposition of the product that is recorded.

Changes in inventories

15.94 While allocating fixed capital formation to product type is relatively straightforward, allocating changes in inventories to product type is challenging. Chapter 10 explains how the types of inventories identified in the System are materials and supplies, work-in-progress, finished goods, and goods for resale. Work-in-progress and finished goods are straightforward to allocate since the products concerned must be those that the unit reporting the inventories produces. Materials and supplies are more complex. Some will be specific to the producing unit reporting them but virtually all producing units will hold some office supplies and cleaning materials, for example, though maybe not to a significant degree. For goods for resale, however, practically all types of goods may be included in inventories. Not only is the range of goods extensive, the pattern of goods held for resale is subject to a high degree of variation over time and even within an accounting period.

15.95 In the exercise of balancing a supply and use table, this uncertainty over the composition of inventories, added to the fact that even the valuation of changes in inventories may be less robust that desired, means that inventories are often estimated indirectly and with the need to balance the supply and use table as one of the operating constraints.

Valuables

15.96 The range of products held as valuables is quite extensive and it is an area where existing goods may feature. For example, antiques and old masters, by their very nature, are not output of the current period. The importance of the value of acquisition less disposals of valuables as an item of capital formation, though, tends to be limited and any major disposal, such as sales by a museum, are likely to be well known.

15.97 Table 15.8 illustrates the capital formation part of a use table.

Table 15.8: The capital formation part of a use table

		Gross fixed capital formation	Changes in inventories	Acquisition less disposals of valuables	Total
1	Agriculture, forestry and fishing products	2	1		3
2	Manufactured goods, mineral and other industrial products	0	- 1		- 1
3	Construction work	0	0		0
4	Wholesale and retail sale, transport, accommodation and food services	161	5	10	176
5	Information and communication services	190	23		213
6	Financial and insurance services	0	0		0
7	Real estate activities	0	0		0
8	Business services	23	0		23
9	Public administration, defence, education, health and social work services	0	0		0
10	Other services	0	0		0
	Total	376	28	10	414
	Of which:				
	Market production	318	25	10	353
	Production for own final use	58	3		61
	Non-market production	0	0	0	0

4. Exports

15.98 The allocation of exports by product requires the same conversion between SITC or HS codes as the allocation of imports does. The valuation of exports is easier, though, since in trade statistics exports are uniformly valued fob. This valuation may not be in perfect accord with the recording in the System since the point of valuation is at the border, not necessarily where change of ownership takes place. As with the valuation of imports, ideally exports should be valued when and where they change ownership from a resident unit to a non-resident unit but, again as with imports, the assumption that this change of ownership takes place at the national border may be the only practical assumption given existing data sources.

5. Introducing value added

15.99 The sum across the rows of the use table, encompassing intermediate consumption, final consumption, capital formation and exports, for each product type must be equal to the sum across the rows of the supply table (domestic production plus imports plus valuation adjustments to make the valuation in the supply table consistent with that in the use table) for the same product type. The sum down each column of the supply table shows the value of output for the relevant type of producing unit. The sum down the column of the use table for the same type of producing unit shows the amount of intermediate consumption of that type of producing unit. It is an obvious extension, therefore, to add two further lines to the use table for the column corresponding to

producing units. The second of these contains the values of output from the supply table, the first contains the difference between this total and the value of intermediate consumption just described and so represents value added for that type of producing unit.

15.100 Introducing the entries for value added and output are key to one of the main purposes of the supply and use tables, that is using the structure to ensure the accounts are internally consistent. Returning to some of the examples quoted in the introductory section illustrates this point.

15.101 Suppose the data from a household survey for cigarette consumption is assumed to be accurate and suppose for simplicity there are no exports of cigarettes. This figure then virtually determines the total use of tobacco products and subtracting imports of cigarettes gives a figure for the output of the domestic cigarette factories. This may be much lower than the amounts reported by the cigarette manufacturers and the compiler may be inclined to think the output of cigarette manufacturers are over-stated. However, the main intermediate input to cigarette manufacture will be tobacco and there will be other figures for either production or imports of tobacco. Given there are few uses for tobacco other than input into tobacco products and exports, if the supply and use table compiler wishes to adhere to the household expenditure survey data, he is faced with assuming that there are errors of over-statement of cigarette manufacture, tobacco production and/or imports.

15.102 Consider the case of taxi services in a country where communal taxis are the main form of personal transport. As well as the value of taxi services reported by the taxi drivers, there may well be information about the number of cars and amount of petrol or diesel claimed as tax deductions because they are used for taxi services. A judgement can be made about whether these inputs are more consistent with the figure from the household expenditure survey than with the reported output figures.

15.103 More generally it should be noted that once the supply and use tables are balanced, any increase in final use for a particular good must be met from increased total supply or decreased intermediate consumption for the same good. If the increased supply comes from domestic production, then value added increases in line with the increases in final use; if the increased supply comes from increased imports, then both value added and GDP are unaffected (or only marginally if there are import taxes on the good in question). Similarly, any increase in intermediate consumption without an increase in domestic output must lead to a decrease in final use and also a decrease in value added.

6. Expanding value added

15.104 Useful as it is to add value added to the bottom of the use table, it is possible and even more helpful to disaggregate value added and show all the entries in the generation of income account (described in chapter 7), as shown in table 15.9.

Table 15.9: The value added part of a use table

	Market production	Production for own final use	Non-market production	Total
Intermediate consumption	1 594	50	239	1 883
Total gross value added/GDP	1 483	97	141	1 721
Compensation of employees	641	12	109	762
Taxes less subsidies on production and imports	56	0	2	58
Mixed income, gross	440	2		442
Operating surplus, gross	346	83	30	459
Consumption of fixed capital	170	22	30	222
Total output	3 077	147	380	3 604

7. Adding other variables

15.105 As well as the entries for the generation of income account, it is possible to add memorandum items relating to other variables that are useful in a study of production at the establishment level. These are gross fixed capital formation by establishment and the number of employees. As discussed in chapter XX, it is preferable to show employment on a full time equivalent basis if this is available.

D. Further elaboration of the use table

1. A use table at basic prices

15.106 So far in this chapter, it has been assumed that both the supply and use tables have been expressed in purchaser's prices and this is done by adding to supply valuation terms that explain the differences between basic prices and purchasers' prices. It is also possible to bring the two tables to a common valuation basis by reducing the use table to basic prices, which is the subject of this section. The main reason to undertake this more arduous task is to facilitate compiling a supply and use table in volume terms, as described below.

15.107 In looking at any element of the use table at purchasers' prices it is clear that it may be made up of as many as six components:

domestic production at basic prices,

imports,

trade margins,

transport margins,

taxes on products,

subsidies on products.

15.108 In order to reduce the use table to basic prices, each element of the table must be decomposed into these six items. This can be seen as creating six similarly sized tables, each of which contain all the items for one of the components. This is much more resource intensive than bringing the supply table up to purchaser's prices where only one column is needed for each of the six components.

Trade margins

15.109 Margin services are an important kind of activity in the System. Many goods pass from the producer to the purchaser by means of a wholesaler or retailer. Indeed, some goods may pass through the hands of several wholesalers on the way to the retailer. Many services, on the other hand, are supplied directly by the producer to the purchaser. This is by no means universal, though. Travel agents and offices offering tickets for sports and entertainment events are examples of a kind of "retailing" for services. In addition, many financial instruments are offered for sale (and are repurchased) with a spread between the buying and selling price. The most obvious example is perhaps foreign exchange. These spreads also represent a margin service supplied to the customer. In the case of services, though, the margin is treated as one of the products of the relevant service industries. In the case of goods, a separate type of producing unit, wholesale and retail trade, handles the margins on all goods.

15.110 As long as the use table is shown at purchasers' prices, there is no separate use of the trade margins provided by wholesalers and retailers. Table 15.4 shows that the additions to the values of various goods are exactly offset by negative entries for the supply of trade margins so that in effect there is no remaining supply to be explained in the use table.

15.111 As explained in chapters 3 and 6, the activity of wholesale and retail trade is one where the System imposes a partitioning of transactions. Considering the supply and use tables explains why this is desirable. Suppose all goods handled by wholesalers and retailers were shown as being delivered to the wholesaler or retailer and then supplied by them to the purchaser. The rows for goods in the supply and use tables would then be rather uninteresting. Virtually all goods would be used by wholesalers and retailers and almost none would be supplied to other producing units, households or government. The pattern of household consumption would show one large item for purchases from wholesalers and retailers and none from any manufacturing industry or agriculture. Even with grocers distinguished from furniture stores, it would no longer be possible to

see exactly what types of food were being purchased and whether it was wooden or metal furniture being sold.

15.112 The standard treatment in a supply and use table, therefore, follows the rules for partitioning transactions adopted for measuring the output of the wholesale and retail activity. Each acquisition of a product from a wholesaler or retailer is regarded as being the acquisition of two distinct products. One is the physical good, valued at producers' prices, the other is the trade margin. The purchase of the good is shown as a use of that good; the margin is shown as a use of services provided by wholesalers and retailers. As noted, though, portraying the activity of wholesalers and retailers in this way in a supply and use table is resource intensive since it is often the case that different proportionate margins are charged to different types of purchasers, for example households paying higher margins than enterprises. Indeed, even within households the margin on the same good in the same outlet may differ with larger quantities having a smaller proportionate margin than smaller quantities. The compiler has thus to apply a considerable amount of specialised knowledge and judgement to make this partition and make it at the detailed product level.

Transport margins

15.113 As explained in reviewing the difference between purchaser's, producer's and basic prices, transport margins only occur when transport services are not separately invoiced. If they are separately invoiced, then no partitioning is necessary because the transport service is already treated as a separate product. When transport is not separately invoiced, it must be identified by partitioning the transaction in the same way as trade margins are identified. Again the compiler's task is demanding because, for instance, suppliers may sometimes offer free transport for purchases over a certain value and charge for smaller deliveries.

Taxes on products

15.114 The fact that VAT on the same product may be deductible for some users (typically producing units) and not deductible for others (households) is one reason why a supply and use table at purchaser's prices may be difficult to interpret. The apparent share of total use by households will be inflated by the element of non-deductible tax as compared with the proportion of use by producing units. After removing trade and transport margins from purchasers' prices estimates, the next step is therefore to remove non-deductible VAT. Removing non-deductible VAT is reasonably straightforward for final users but may be more complicated for intermediate consumption where most, but not all, VAT may be deductible. Once non-deductible VAT is deducted, the entries in the use table are valued at producers' prices.

15.115 For some countries it may not be possible to go beyond this but if possible removing other taxes on products as well is desirable, leaving the entries in the use table at basic prices. When this is done, it is necessary to introduce a new row into the use table. This is a row that shows the taxes on products payable by the producing unit concerned. This row is part of the cost of intermediate consumption at purchaser's prices in the same way as the entries for trade and transport margins are. It will include some taxes on imports when imports that are part of intermediate consumption are subject to taxes on entry to the economy. This row of taxes within the intermediate consumption part of the use table should not be confused with the row that may appear in the value added part of the use table when output is valued at producers' prices. That row shows the amount of taxes on products payable on the products supplied by the unit, not the taxes on products payable by the unit on products used by them.

Subsidies on products

15.116 If it is possible to remove taxes on products from the entries in the use table, then subsidies on products must be added back also. There is no counterpart to VAT within subsidies so the elimination of subsidies matches the elimination of taxes on products other than VAT

Separating imports from domestic production

15.117 A further refinement of the use table in basic prices is to separate imports from domestic production.

In some cases, if the only source of a product is from the rest of the world, or if none of the product is imported, there is no problem in making the separation. When products are available from both domestic and foreign sources, making the separation is difficult. One solution may be to work at a more disaggregated level if that helps identify products that are always or never imported, but in general making the separation is a process involving considerable expert knowledge and informed judgement.

15.118 Table 15.10 shows an abbreviated version of the partition of the use table for producing units into the six components described here.

Table 15.10: Breakdown of use by producing units into the six elements making up purchasers' price valuation

	Domestic production	Imports	Trade margins	Transport margins	Taxes on products	Subsidies on products	Total
1 Agriculture, forestry and fishing products	60	27	1				88
Manufactured goods, mineral and other 2 industrial products	34	60	2				96
3 Construction work	118	1			4		123
Wholesale and retail sale, transport, 4 accommodation and food services	825	100	30	5	32	0	992
5 Information and communication services	40	0					40
6 Financial and insurance services	39	21			1		61
7 Real estate activities	58	16			4		78
8 Business services	287	17			5		309
Public administration, defence, education, 9 health and social work services	95	0					95
10 Other services	1	0					1
Total	1 557	242	33	5	46	0	1 883

2. Expressing the use table in volume terms

15.119 The supply and use framework not only constrains the current value estimates of supply and use to balance exactly, it also provides a way to ensure that the corresponding volume estimates, expressed in the prices of another year are in balance and that the series of prices implied by the existence of one table in current prices and one in volume terms are strictly consistent

15.120 The general question of the development and use of appropriate prices to deflate national accounts is the subject of chapter 16. What follows, therefore, anticipates that general discussion but is provided here to complete the discussion on supply and use tables.

15.121 In most countries there are sets of price indices available for consumer prices, producer prices and import and export prices. Separate international manuals on the methodology and compilation of these exist. (ref)

Domestic product flows

15.122 Consumer price indices (CPIs) are applicable for deflating household consumption at purchasers' prices but at a disaggregated level. The weights used to compile CPIs are usually not entirely consistent with the weights implicit in the column of expenditures for household consumption. This is because the weights may relate to another year, and may exclude some categories of expenditure. The CPIs are likely to have been derived from a household survey. Household surveys often exclude the richest and poorest households, so the coverage is less comprehensive that the household consumption figures in the supply and use tables. As explained above, the act of balancing the table may cause some elements from the household survey to be amended. In the case of tobacco products, for instance, in principle similar adjustments to the CPI weights should also have been made but in some other cases, matching adjustments to the CPI weights may not have been made.

15.123 Confusingly, the prices known as producer price indices (PPIs) correspond not to the System's concept of producer prices but to basic prices. They exclude both trade and transport margins and the effect of taxes less subsidies on products. Once the use table has been partitioned into the six components described in the previous section, PPIs can be used to deflate the rows corresponding to domestic production. Doing so assumes that the elements of the rows are homogeneous and there are two reasons why this may not be so.

15.124 The elements of the rows at purchasers' prices are certainly not homogeneous as they include trade and transport margins on the one hand and taxes less subsidies on the other. As noted, these may not fall on the same product in the same proportion for different users. Eliminating these entries should reduce this cause of non-homogeneity but there will inevitably be a degree of approximation involved in the exercise so some residual non-homogeneity from this cause will persist.

15.125 The other cause of non-homogeneity is due to aggregation. Even with a very large number of products distinguished in the supply and use tables, there is still a considerable degree of aggregation in each row. Even if screws were separated from other metal products, the price of screws varies according to the length, diameter, type of head and material they are intended to be used in. It is obviously impracticable to introduce a degree of disaggregation that would identify each of these types of screw separately and the thought of identifying screws separately from nails and other metal construction materials is already implausible. The problem of non-homogeneity is thus inevitable but may be reduced by considering the level of detail available in PPIs when determining the type of products to be identified in the supply and use tables.

Imports and exports

15.126 Import price indices can be problematical. Many countries rely on unit value indices that do not take quality change into account adequately. Even when true import price indices are available, there is the problems of matching the degree of detail in the price indices with that of the products in the supply and use tables. Further, as mentioned in describing the correct valuation of imports, import price indices inevitable make different assumptions about how trade and transport margins are paid for than may be the case for individual purchasers. This can be seen clearly in the case of export prices. The difference between export prices and PPIs for an identical product is due to the assumption that export prices are valued at the border of the economy whereas PPIs are valued as the goods leave the factory.

Trade and transport margins

15.127 Trade and transport margins also need to be expressed in volume terms. A frequent way of approaching this is to assume that the rates applying in the year used as the reference year for the volume terms should be applied to the volume terms figures of the items subject to the margins. In this way the volume figures relate not just to the prices of a given year but also the pattern of margins in that year. The implied deflator for trade margins is then the same as the implied deflator for the goods concerned, implying in turn that the whole of the margin change is seen as a volume change and not a price change, an assumption that may be questioned. Applying the current period margin to volumes expressed in reference year prices is equivalent to expressing the purchaser's price of an item as comprising two elements, one the price of the good at basic prices and one the margin element. Under this assumption the whole of the change in the margin rate is a price effect with no element of a volume effect. This too may be questioned Further discussion of the way to derive estimates of margins in volume terms may be found in the manuals on CPIs and PPIs.

Taxes less subsidies on products

15.128 The approaches to expressing taxes less subsidies in volume terms are similar to those used for margins.

Value added

15.129 In the System, balancing items such as value added are regarded as not having price and volume dimensions. Nevertheless, it is possible to express them "in real terms" by using the balancing item approach to derive a figure from the volume estimates of the other items in the account.

15.130 Given the existence of PPIs for the rows of the use table, these can be applied to the rows of the supply table also and the column sums then give a figure for output in volume terms also. Deducting the figures for intermediate consumption in volume terms derived from the deflation exercise for the product rows in the use table permits the calculation of value added for each type of producing unit as a residual. It is this residual that is described as being "in real terms". It is also possible to derive an implied deflator for value added by dividing the current value by the value in real terms.

15.131 Many analysts are interested in pursuing the question of deflating value added more explicitly. Calculating compensation of employees in volume terns is possible if enough information is available

on wage rates and numbers employed by category of worker. Allowance must be made for changes in non-wage compensation and changes between full-time and part-time staff but there are few conceptual problems in deflating compensation. Deflating taxes less subsidies on production is possible using the techniques just described for taxes less subsidies on products.

15.132 Deriving figures for operating surplus and mixed income in real terms is possible by subtracting compensation of employees and taxes less subsidies on production in volume terms from value added in real terms. However, the advocates of the capital services approach to measuring operating surplus suggest a more direct means of deriving operating surplus in real terms. This approach is not a standard part of the System but is described in chapter XX(19).

E. Numerical example

15.133 Table 15.11 shows a full supply and use table. The topmost part consists of the supply table. The first column shows total supply at purchasers' prices. This is followed by information first on trade and transport margins and then on taxes and subsidies on products. These columns correspond to tables 15.4 and 15.5. Deducting all these from total supply at purchasers' prices gives the next column, which is total supply at basic prices. This is followed by the largest part of the table, the supply of products by type of domestic producing units. This is an expanded form of table 15.1. At the extreme right of the supply table is the information on imports, corresponding to table 15.3.

15.134 The middle part of table 15.10 is the product part of the use table. The first column is total supply at purchasers' prices and corresponds exactly to the column above in the supply table. The next three columns are blank in the use table. Then the detailed information on use of products by type of producing unit is shown,. This is the expanded version of table 15.6. The column for exports and columns for final consumption and capital formation follow. These correspond to tables15.7 and 15.8.

15.135 Below the product part of the use table is the value added part. In the columns for taxes and subsidies, information on taxes and subsidies on production is shown. Details of the generation of income account for each of the types of producing unit are shown under their use of products as intermediate consumption. Information on capital formation by type of producing unit and employment are also shown. There are no entries under the columns for exports, final consumption or capital formation.

******Present table 15.1 to appear here. Note; in the earlier tables I have changes the stubs to match the top-top classification but have NOT yet changed any of the data values. This will be done to give plausible entries.***

15.136 Table 15.12 *(present table 15.2)* shows the components of the use table for trade and transport margins, taxes on products and subsidies. The elements for producing units correspond to entries in table 15.10. Table 15.13 *(present table 15.4b)* shows the whole of the use table at basic prices. Table 15.14 (present table 15.5) shows the imports elements of the use table.